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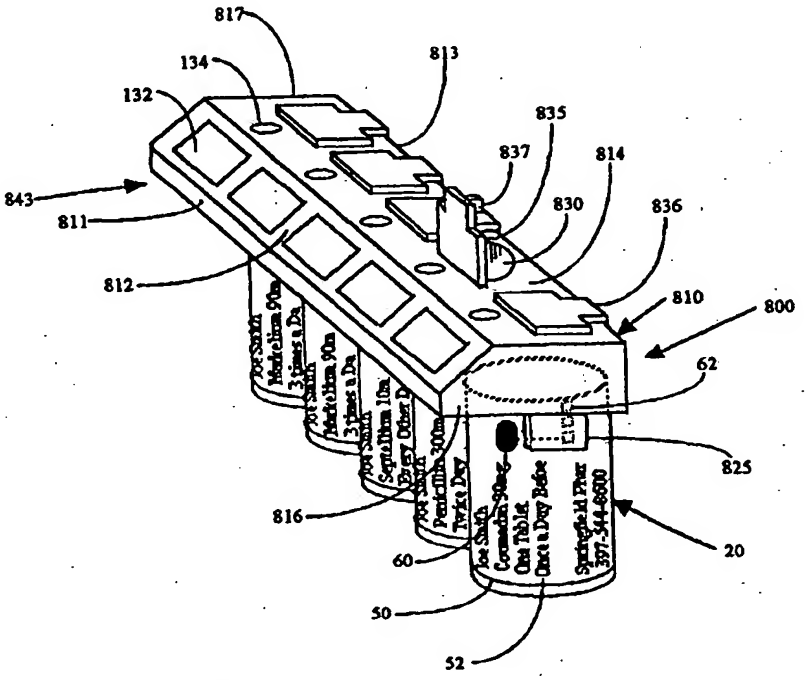
(54) Title: MULTI-VIAL MEDICATION ORGANIZER AND DISPENSER

(57) Abstract

This invention relates to a medication container that organizes several vials or cassettes of different types of medication by securing the vials to a unitary lid. A machine readable memory strip is affixed to each vial. Each memory strip contains prescription information and medication information pertaining to the medication in the vial. The unitary lid is equipped with sensors that read each memory strip and transmit the information to the computer processor and its associated memory device. The processor determines when each medication is to be taken and signals the patient to take the appropriate medication from the appropriate vial at the appropriate time. Indicator lights and a display are provided for this purpose. The vials are standard or slightly modified child-proof pill containers, but can take the form of a blister pack dispenser or other containers as well. The lid is provided with a mechanism for dispensing or allowing the removal of medication from the vials, and obtaining actual medication consumption information based on when the pill is dispensed or when the lid is opened. This actual consumption information is used to keep inventory information regarding the number of each type of medication doses remaining in the container. The memory strips can be machine readable and writable so that they can be altered to include actual consumption information and inventory information. The automated lid contains a receiver for obtaining updated medication dosing information based on current laboratory tests or physical observations of the physician regarding the patient.



MULTI-VIAL MEDICATION ORGANIZER AND DISPENSER

TECHNICAL FIELD

This invention relates to a medication container that organizes several vials or cassettes of different types of medication by securing the vials to a unitary lid equipped with a computer processor that reads an information strip affixed to each vial and signals when medication is to be dispensed from each vial.

patient. Conventional medication containers designed for a patient's personal use on an out-patient basis do not assist the patient in taking the correct medication at the correct time, particularly when several medications have been prescribed.

The ability to comply with prescribed medication dosing requirements is complicated in situations where dosing amounts change over time. For example, prescribed dosing amounts are frequently a function of ongoing laboratory tests that determine the patient's medication needs. In these situations, physicians need to be able to easily communicate changes in dosing amounts to their patients as quickly as possible. Medication compliance is particularly important when powerful medications are prescribed, and over-medicating or under-medicating a patient can lead to serious side effects, illness and even death. Yet, keeping patients in hospitals for a prolonged period of time to ensure that dosing regimens are changed when necessary is not considered a practical solution.

The process of taking several medications at the appropriate time is further complicated if the medication or an illness causes the person to think less clearly or to be forgetful. There is the anxiety of being uncertain if you took the medication earlier in the day. Then, there is the problem of patients completely forgetting to take their medication. The first condition is alleviated by simply indicating when the medication is to be taken next. If the container indicates a future time or day to take the next medication, the patient knows that they have taken the current dosage. If the container indicates a present or past time, the patient knows that they should take the medication now. To solve the problem of completely forgetting to take a dosage of medication, a container will typically contain an alarm to remind the patient to take the medication. Unfortunately, the presently available products and the above patents suffer from one or more problems or limitations.

etc." In fact, there is some question regarding the legality of a care giver removing medications from pharmacist supplied containers and placing them into other containers. There is good reason for caution regarding the shuffling of medication from one container to another. Given the strength of many medications in use today, any confusion about the medications put in the secondary container or any confusion regarding the prescription regimens could have a significant adverse affect on the patient.

A still further problem is that the patient must program a timing or alarming mechanism in an automated dispenser by manual entry of additional coded data. A magnetic strip or smart card can also be used to enter the data. Unfortunately, the cards are easily misplaced and errors can result if the wrong data is entered into the dispensing machine manually or via an incorrect card. In addition, such dispensing machines have to be returned to the pharmacist frequently for reprogramming when a new medication is prescribed.

A still further problem is that many medication containers do not provide a means for counting the number of pills remaining in the container or the number of pills taken to date. The patient or care giver must manually enter the amount of medication dispensed or account for the quantity of medication remaining after each dose is consumed. In situations where the unused portion of a prescribed medication is returned to the pharmacy, such as in a hospital setting, the pharmacist must manually count the number of pills left in the container.

A still further problem with conventional automated medication containers is that they do not record the actual dosing regimen taken by the patient. A patient could take the medication too early, too late or completely miss taking the medication at various times. This results in a sporadic actual consumption or dosing regimen for the medication. The containers in use today do not provide an easy method of communicating the sporadic extent

medication is to be taken and signals the patient to take the appropriate medication from the appropriate vial at the appropriate time. Indicator lights and a display are provided for this purpose. The vials are standard or slightly modified childproof pill containers, but can take the form of a blister pack dispenser or other containers as well. The lid is provided with a mechanism for dispensing or allowing the removal of medication from the vials, and obtaining actual medication consumption information based on when the pill is dispensed or when the lid is opened. This actual consumption information is used to keep inventory information regarding the number of each type of medication doses remaining in the container. The memory strips can be machine readable and writable so that they can be altered to include actual consumption information and inventory information. The automated lid contains a receiver for obtaining updated medication dosing information based on current laboratory tests or physical observations of the physician regarding the patient.

One advantage of the present medication container invention is to improve patient compliance in selecting the appropriate medication from several vials of different medications, and taking that appropriate medication on schedule. The invention is of particular use when the patient has been prescribed to take several medications with dosing regimens that require the patient to take different amounts or doses of different medications at different times. The automated lid can easily instruct the patient to take two doses of medication A by lighting an indicator light by the appropriate vial and displaying a message to take two pills. Once medication A has been dispensed, the lid can instruct the patient to take on dose of medication B in a similar manner. This prevents a patient from inadvertently taking one dose of medication A and two doses of medication B. The automated lid is also helpful when medications are taken in a paired dosing regimen, with medication A being taken on Monday, medication B being taken on Tuesday, medication A on Wednesday, etc.

small label. The memory or memory strip contains information regarding the number of pills or capsules to be taken per dosage and the dosing regimen, e.g. daily, four times a day, before a meal, etc. The memory strip also contains information regarding the medication, such as the medication name, expiration date, quantity in container, patient name, pharmacy name, address and telephone number, pharmacy prescription number, prescribing doctor name and telephone number.

A further advantage of the present invention is that the memory strip contains special prescription requirements and instructions that are expressed in the form of a series of processor instructions such as those written in the Java or other computer language, as opposed to a simple four times per day dosing regime. The prescription requirements can, for example, indicate frequent dosages of a medication when starting a medication, then indicate a gradual reduction of medication, and finally indicate a sustained steady dose after several days.

A further advantage or the present invention is that the memory strip can contain prescription requirements that include instructions for alternating between differing medications in a controlled sequence. For example, some advances in Acquired Immune Deficiency Syndrome (AIDS) medication protocols require the patient to consume two or more medications, but on alternating or sequential days. Although each medication is held in a separate container, the memory strip on each medication container could provide instructions on taking both medications.

A still further advantage of the present invention is that the interactive label is compatible with the vials used in standard or slightly modified pharmacist supplied medication containers. Special vials are not necessary. Medication can be inserted in standard or slightly modified pharmacist supplied container and a memory strip affixed to the

prescription for the medication in the container can be discarded or returned to the pharmacist or physician. The more expensive automated cap is reused for subsequent prescriptions, thereby reducing the long term cost of the automated container.

A still further advantage of the present invention is that the information in the interactive label and the microprocessor memory is used to alert the patient when it is time to take a dose of medication and how many pills or capsules to consume. The interactive label and microprocessor are also used to warn the patient to defer taking medication at the present time, or indicate at what time the next dose of medication is to be taken. These alarms and indicators should increase patient compliance in taking medication according to the prescribed regimen.

A still further advantage of the present invention is that the automated medication container can convey information to a separate device such as a patient's home computer to aid in alerting the patient to take the medication in a timely manner. For example, the patients' home computer can page the patient when it is time to take a dose of medication.

A still further advantage of the present invention is that the interactive label and automated cap are compatible with a conventional medication container having a cylindrical vial and childproof cap. See **Figure 1**. The pharmacist can dispense medication in a standard or slightly modified childproof container affixed with the interactive label. The patient is then free to replace the conventional childproof cap with an automated childproof cap.

The conventional medication vial can be easily modified to facilitate use with the interactive label. The slightly modified vial includes a guide and limiting ring molded around the periphery of the vial. The interactive label is aligned with an opening in the ring. A sensing tab in the cap extends through the opening in the ring and over the contacts for the

An additional advantage of the present invention is that it can be used to record actual medication consumption information. The timing circuit enables the automated cap to obtain actual consumption information by recording when the cap is removed from the medication vial. Removal of the cap disrupts the alignment of the sensing tab with the contacts of the memory strip. This disruption or returning the cap to seal the vial establishes the time and date the user consumed the medication. The prescription timing regimen is used to compute the next time the patient should take the medication. When the cap is replaced and the information in the memory strip matches the information previously recorded into the memory of the microprocessor, the microprocessor determines that the user just removed the cap, consumed a dose of medication, and replaced the cap.

A still further advantage of the present invention is that the cap computes the next time the patient is to take the medication and displays this information to the patient. The time and or date or day is displayed via a display such as a LCD device in the cap. By reading the display, the user can easily and reliably determine the next time to take the medication. The LCD display includes the number of pills or capsules to be consumed. Given enough display area, specific instructions for taking the medication will be presented, e.g., "consume 2 hours before eating."

A still further advantage of the present invention is that the cap can alert the patient to take the medication by sounding an audible alarm, illuminating an indicator such as an LCD, or rotating an eccentrically positioned weight to cause a vibration alert. These alarms should improve patient compliance.

A still further advantage of the present invention is that prescription information on the memory strip is conveyed to the patient's personal home computer, or a hospital or nursing home computer. The information on the memory strip controls additional alerting

regarding the medication prescription.

A still further advantage of the present invention is that the blister pack and interactive label can be inserted into a dispenser having a compatible sensing element, microprocessor, memory sensors, optional alerting device LCD display. This dispenser alerts the patient when to take medication, helps ensure that the medication is not accessible to a child (childproof), prevents the patient from taking too much medication or taking it prematurely, and indicates when the medication supply is being exhausted to allow the patient adequate time to obtain a refill of the prescription. The dispenser also includes a mechanism for assisting the patient in dispensing the medication from the blister pack.

Other advantages and aspects of the invention will become apparent upon review of the specification, claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a conventional, childproof, medication container consisting of a cylindrical vial and a removable cap.

Figure 2 is a perspective view of a first embodiment of the present invention where the medication container includes a cylindrical vial with an interactive label having an electronic memory strip, and an automated cap that seals the open end of the vial.

Figure 3 is a perspective view of the first embodiment of the invention showing the automated cap removed from the vial to reveal the electrical contacts of the memory strip

Figure 4 is a cross sectional, side plan view of the first embodiment of the invention showing the electronic memory strip and its electrical contacts on the wall of the vial, and an automated cap with a resilient sealing disc, battery, audio, illuminating and vibrational

Figure 13 is a cross-sectional view of a second embodiment of the invention where the medication container includes a cylindrical vial with an interactive label having an electronic memory strip, and a conventional cap.

Figure 14 is a front perspective view showing a sensing device used to convey information in the memory strip of the medication container to a separate computer.

Figure 15 is a rear perspective view of the sensing device showing the sensors that engage the electrical contacts of the memory strip.

Figure 16 is a perspective view of a third embodiment of the present invention where the medication container includes a cylindrical vial with an interactive label having a plurality of conductive or reflective surfaces, and an automated cap that seals the open end of the vial.

Figure 17 is an elevation view of the automated cap for the third embodiment of the invention showing a plurality of sensors on the inside of the cap that sense the conductive or reflective surfaces of the interactive label.

Figure 18 is a top, plan view of a fourth embodiment of the present invention where the medication container is a disc shaped blister pack with an interactive label having an electronic memory strip affixed to a central surface of the blister pack.

Figure 19 is a side, cross sectional view of **Figure 18** taken along line 19-19 showing a dose of medication in a pocket of the blister back and the interactive label affixed to the tear resistant sheet.

Figure 20 is a top, plan view showing the lid of a semi-automated dispenser equipped with a dispensing lever, finger latches, a display, an audible alert, "Eject" and "Next Dose" buttons.

schematic.

Figure 29 is a perspective view of a multi-vial medication container with the vials secured to portholes located along a top platform of an L-shaped unitary lid, and the lid containing a single display and several selectors for removing medication from the vials.

Figure 30 is a partial, rear cross-sectional view of the multi-vial medication container of **Figure 29** showing one inverted vial secured in an associated porthole with its selector in its closed position, and an adjacent selector in its open position.

Figure 31 is a perspective view of a multi-blister cassette medication container, where each cassette is secured to a slot in the top of the platform of the L-shaped unitary lid, and each cassette holds a free end of the blister strip extending through an associated opening in the lid.

Figure 32 is a partial, rear sectional view of the container of **Figure 31** showing one blister cassettes secured in its associated slot.

Figure 33 is a side sectional view of the container of **Figure 31** showing its blister strip coiled inside the cassette with the blister pack at the free end in a reserve position.

Figure 34 is a perspective view of the blister cassette used with the medication container of **Figure 31**, the cassette being equipped with a bar code memory device.

DETAILED DESCRIPTION

The present invention relates to a medication container with an interactive label. While the invention is susceptible of embodiments in many different forms, there are shown in the drawings and will herein be described, several forms of the invention with the understanding that the present disclosure is to be considered as an exemplification of the

as discussed below. The second alignment means is accomplished by a guide ring 30 protruding from the outer surface 27 of the vial 20. The guide ring 30 is located at a substantially uniform, predetermined distance from the open end 25 of the vial. The guide ring surrounds most of the wall 22 of the vial. The guide ring has an opening 31 defined by its two ends 32 and 34. The ends 32 and 34 of the guide ring 30 are spaced apart a predetermined distance so that opening 31 has a predetermined size for accommodating sensing tab 110 as discussed below. While the second alignment means is shown and described as being guide ring 30, it should be understood that the second alignment means could take on other forms without departing from the broad aspects of the invention.

The vial 20 has several securement ratchets 40 for securing and sealing the cap 100 against the open end 25 of the vial. The ratchets 40 are evenly spaced around the open end 25, and protrude from the outer surface 27 of the vial 20. The ratchets are similar to those found on conventional childproof medication containers as in **Figure 1**. Each ratchet includes a cup portion 42, a top surface 44, a wedge 45 and a side surface 46. Although the ratchets 40 are shown and described as being evenly spaced from each other as in a conventional vial, it should be understood that one or more of the ratchets could be offset. Such an offset arrangement could be used to accomplish the second alignment means in lieu of guide ring 30.

As best shown in **Figures 3-5**, medication container 10 includes interactive label 50. The label 50 is affixed in the recess 28 in the wall 22 of the vial 20 so that the left edge of the label abuts and is aligned with the ridge 29 forming the left side of the recess. The upper edge of the label 50 abuts the ridge forming the upper side of the recess 28. This alignment positions the label 50 into its desired location on the wall 22 of the vial 20.

The memory strip 60 also contains medication information 84 and program codes 86 for downloading into or otherwise being sensed or read by the computer processor 120 of the automated cap 100. The electrical contacts 62 and wires 64 communicate with the memory strip 60 so as to access the information 80 in or write additional information to the memory strip. As discussed below, the memory strip 60 can be electronically altered or written to via the processor 120 to store information designating when the cap 100 is removed and reattached to the vial 20, such as removal information 84 indicating that a dose of medication 15 was removed from the vial, quantity information 84 regarding the number of doses remaining in the container, or removal time, disruption or compliance information 84 indicating actual compliance to the prescribed dosing regimen 82. It should be understood that any combination of predetermined information taken from the contents 80 of the memory strip 60 could be communicated to the computer processor 120. The computer processor 120 could use the predetermined information to select or develop desired information for communicating to the patient or care giver.

As best shown in **Figures 4, 5 and 7,** the cap 100 includes a main body 101 with a top portion 102 and a cylindrical rim 103 having an inside surface 104 and a lower edge 105. The cap 100 includes several hold down lugs 106 and a resilient disc much like those in conventional caps of the type shown in **Figure 1**. The hold down lugs 106 are located around the inside surface 104 of the rim 103 near its lower edge 105. The number of hold down lugs 106 coincides with the number of ratchets 40, and the lugs are evenly spaced to align with the ratchets. The resilient disc 108 is attached to the inside surface of the cap 100.

The ratchets 40 interact with the hold down lugs 106 to form a relatively tight, child resistant or childproof seal between the cap 100 and the vial 20. This is accomplished by

which aligns the sensors 115 of the sensing tab 110 into electrical engagement with the contacts 62 of the memory strip 60. Specifically, the cap 100 can only be placed on the open end 25 of the vial 20 with the sensing tab 110 abutting or nearly abutting the right end 32 of the guide ring 30. The cap 100 is then rotated in a clockwise direction until the sensing tab 110 abuts or nearly abuts the left end 34 of the guide ring 30 and the hold down lugs 106 have come to rest in the cups 42 of the securement ratchets 40 so that the cap 100 is in its secured position on the vial 20.

As shown in **Figure 9**, the automated cap 100 has a control system 114 that includes a computer processor 120 with its own memory 125. The processor 120 and memory 125 are located on and in electrical communication with a circuit board 130 located inside the cap 100 for protection. (See **Figure 4**.) The circuit board 130 electrically connects the processor 120 to a visual communication device such as an LCD display 132. The LCD display 132 visually displays desired information to the patient, such as the date and time the next dose of medication is to be taken and the number of pills to be taken. The display 132 can also indicate an alert or warning to the patient, such as the fact that the patient is so overdue in taking a dose of medication that that dose should no longer be taken. The circuit board 130 also electrically connects the processor 120 to a variety of alarming devices such as audible, visual and vibrational communication devices or alarms 134, 136 and 138, respectively. These alarms 134, 136 and 138 indicate a variety of warnings to a patient, such as when it is time to take a dose of medication. The circuit board 130 also electrically connects the processor 120 to a communication device such as an infrared transmitter 140 that transmits information to or receives information from a separate personal or business computer 270 as discussed below.

understood that the buttons could be located on the outside surface of the cap as well.

As shown in **Figures 9-11**, automated cap 100 further includes an access control device formed by the computer processor 120 and a device such as solenoid locking assembly 180 that is in electrical communication with the processor via the circuit board 130. The locking assembly 180 controls the patient's ability to access and remove the medication 15 from the vial 20 until the time the next dose of medication is due according to the prescribed dosing regimen. The assembly 180 includes an armature 182 and a spring 184 for biasing a plunger 186 into a normal, extended position as shown in solid lines in **Figures 10** and **11**. As explained above, to seal the vial 20, the cap 100 is first aligned with open end 25 of the vial so that the hold down lugs 106 are positioned above and in between the ratchets 40 of the vial. (See **Figure 10**). The cap 100 is then depressed into a removably aligned position over the open end 25 so that the lugs 106 move directly between the ratchets 40. The plunger 186 contacts the upper surface 44 of the ratchet 40 which causes spring 182 to compress. This is shown in **Figure 10** in phantom lines. The cap 100 is then rotated clockwise into its secured position where each hold down lug 106 rests in the cup 42 of its respective ratchet 40. When in this secured position, plunger 186 clears the side 46 of the ratchet 40 so that spring 184 biases the plunger into its normal, extended position. Attempts to remove the cap 100 by rotating it counterclockwise are resisted by plunger 186 which abuts the side 46 of the ratchet 40. The cap 100 is now locked into its secured position. The processor 120 is programmed to activate the solenoid locking assembly 180 to draw up the armature 182 and plunger 186 when the next medication dosage is due to be taken. Only then can the cap 100 be rotated counterclockwise and removed.

achieved in the same manner as the alignment of the contacts 62 and sensor 115.

Operation of First Embodiment

When the automated cap 100 is secured to the medication vial 20, the control system 114 is complete. The sensors 115 on the tab 110 of the cap are in electrical contact with the contacts 62 of the memory strip 60, and the information 80 in the memory strip is in electrical communication with or can otherwise be read by the processor 120 in the cap. Predetermined portions of information 80 from the memory strip 60 are compared with the information that had previously been read and stored in the memory 125 of the cap 100. If the predetermined information 80 is the same as before, the processor 120 will compute the next prescribed time for taking a dosage of medication 15 and activate an alarm or otherwise communicate that information to the patient when that time occurs. If the cap is not returned to seal the vial 20 to which it was previously attached, the audible alarm 134 will be activated by the computer 120. The patient or care giver can disable the alarm 134 by securing the cap 100 back on the correct vial 20. If the cap 100 is not returned to the correct vial 20 and the alarm 134 is ignored for a period of time or the user presses button 160, the alarm is disabled, and the new information 80 in the new memory strip 60 is stored in the memory 125 of the cap 100 and used to compute the next dosage time for the new medication. The automated cap 100 will keep an accurate count of the number of times the medication container is opened each day and advise the patient against consuming too many pills in too short a time. This is particularly useful for medications 15 that are prescribed to be used on an as needed basis (e.g. pain medication), but not to be consumed more than a certain amount in any given day.

When the automated cap 100 is removed, it can no longer read the memory strip 60. This triggers an event that can be used to store the current date and time in memory 125 of

remind the patient when to take the medication 15. This is accomplished by having the computer 270 activate a variety of its alarms, or by having the computer page the patient with a message to consume a specific medication, or by calling the patient using a telephone to convey a verbal message to consume a specific medication. In this manner, the patient can extend the alarm and alerting devices beyond what is available in the cap 100, or to have alerts be issued even if a conventional cap is used.

If a patient is taking several medications 15 and the information 80 contained in the memory strip 60 for each container 10 is transferred to a separate personal or business computer 270, the computer can reference and compare the lists of contraindicated medications which are part of the medication information 84. Should two or more medications 15 be contraindicated for use together, the patient will be alerted to this fact. Every time a medication 15 is issued to a patient, the most recent list of contraindications is included in the memory strip 60 of the container 10. If the patient does not have a software program capable of performing this function, the program codes 86 will contain a program that is transferred from the memory strip 60 to the computer 270 to perform this check. This program may use a Java programming language so that it can be used in a wide variety of computer processors 270. Other program codes 86 can be sent to the automated cap 100 or computer 270 to perform various alerting functions.

Second Embodiment

Figures 12-15 show a second embodiment of the invention where the container 200 includes a conventional, childproof cap 260 as shown in **Figure 1**, in place of the automated cap 100. The vial and interactive label that are interchangeable with the vial 20 and label 50 of the first embodiment. The interactive label 50 is electrically linked to the separate

includes a vial that is interchangeable with the vial 20 in the first embodiment. The label 350 includes two rows of conductive or non-conductive contacts 352 and 354. These contacts 352 and 354 can also take the form of reflective or non-reflective surfaces. These contacts or surfaces 352 and 354 represent 1s and 0s. The contacts or surfaces 352 and 354 combine to form a code representing the prescription regimen.

The inside surface of downwardly projecting sensing tab 372 includes sensors 374 that detect the presence or absence of a conductive or reflective surface 352. When the surfaces are conductive, one of the conductive surfaces 352 acts as a ground surface 356 for the remaining surfaces 352. By detecting a voltage or current between the ground 356 and any of the other conductive surfaces 352 a bit of information may be read as a 1 or a 0. By combining the bits of information together, a binary number may be created that can represent a prescription information 202.

In **Figure 16**, there are a total of ten contacts or surfaces 352 and 354. One contact or surface is the ground 356. Another second contact or surface 358 is used to sense when the cap 370 is removed. Of the eight remaining contacts or surfaces 352 and 354, two are used to indicate the dosage, for example a 0 may represent one pill, a 1 to indicate two pills and a 2 to represent three pills, and a 3 to indicate four pills are to be taken as each dosage. The remaining six contacts or surfaces are combined to represent a number between 0 and 63. These surfaces 352 and 354 are used to represent the timing of the prescription regimen, 0 to represent a dosage every 2 hours, a 1 to indicate a dosage every 3 hours, a 2 to indicate a dosage every 4 hours and so on. While ten surfaces are shown and described, it should be understood that more or fewer may be used.

The conductive or reflective surfaces 352 may be part of a larger conductive or reflective surface (not shown). A non-conductive or non-reflective surface 344 may be

and rear surfaces 422 and 424. The front surface 422 is secured to the rear surface 413 of the tear resistant sheet 411 via the adhesive coating 419. The backing sheet 420 extends over the pockets 415 so that each doses of medication 15 is sealed into its respective pocket. The tear resistant sheet 411 has perforations 430 that separate each pocket 415 into a discrete portion 432 that is separable from the remainder of the container.

An interactive label 450 is attached to the flat, central area 416 of the front surface 412 of the tear resistant sheet 411 via an adhesive layer 451. The label 450 has a textual portion 452 with prescription information printed on its front surface. The label 450 includes a memory strip 460 similar to that used in the first and second embodiments. The information in the memory strip 460 is the same as the information 80 in the first and second embodiments. The electronic memory strip 460 is sensed through its contacts 462 via an electrical connection or wire 464. The opening 417 and notch 418 in blister pack 400 are used to mount the single dosage container 400 into a predetermined position in the dispensing device 500. The opening 417 and notch 418 ensure that the blister pack 400 is placed in a secure position in said dispenser 500, and that the sensing contacts 462 are aligned with sensors for electrically communicating with the memory strip 460.

Figures 20-23 show the semi-automated, clam shell medication dispenser 500 for housing and dispensing medication 15 from the blister pack container 400. The dispenser 500 has a lid 510 with a dispensing lever 514 and a plunger 515 that combine to form a dispensing mechanism for dislodging a dose of medication 15 from its pocket 415 in the blister pack 400. Finger latches 520 are arranged on both sides of the dispensing lever 514 and plunger 515. The latches 520 are integrally connected to locking struts 522 which engage the dispensing lever 514. (See **Figure 20**). To dispense a dose of medication 15, the

These buttons 525 and 528 and communication devices 542 and 544 are in electrical communication with the computer processor 530 via the circuit board.

The dispenser 500 has a base 560 that is hingably attached to the lid 510 by hinge 562. The base 560 includes a battery 550 for powering the electrical components in the dispenser, and a battery access door 552 to permit periodic replacement of the battery. The base 560 has a dispenser opening 565 through which the backing sheet 420 of one of the discrete portions 432 of the blister pack 400 can be seen, and through which individual doses of medication 15 are dispensed. To assist in breaking or tearing the backing sheet 408, a portion of the dispenser opening 565 has a sharp interior edge that cuts into the surface of the backing sheet 420 as the sheet is pressed against the edge. The base 560 of the dispenser 500 also includes a flange 564 that secures the lid 510 to the base 560 when in the closed position. Alignment ribs 566 project upwardly from the inside surface of the base 560 to keep single dosage container 400 adequately raised so a drive spindle 570 passes through the central opening 417 in the tear resistant sheet 411 when the dispenser 500 is closed. The alignment ribs 566 and the shape of the spindle 570, which matingly engages the central opening 417 and offset notch 418 of the blister pack 400, combine to form a mechanism for selectively aligning one of the pockets 415 with the plunger 515 of the dispenser. **Figure 24** shows an alternate embodiment of the blister pack container 400. In this embodiment, the interactive label 450 is affixed to the surface of the backing sheet 420. A window 568 made of clear plastic is provided in the base 560 of the dispenser 500. The window 568 allows the patient to read the contents of the prescription text 452 when the dispenser is closed.

The dispenser 500 is equipped with a drive spindle 570 and a motor 572 for automatically dispensing the medication 15. The motor 572 is relatively flat in design similar to those used in portable CD players. The computer processor 530, motor 572 and spindle

dispenser closed.

The information 80 in the memory strip 460 is transferred to processor 530 so that the prescription regimen is shown on the display 544. When it is time to take a medication 15, the processor causes audible alarm 542 to sound an alert. The patient then presses the "Next Dose" button 525. Processor 530 causes motor 572 to rotate the spindle 570 and single dosage container 400 to the next available filled pocket 415. The patient then releases the dispensing lever 514, as previously described, and lifts the lever up to dispense a dose of medication 15. When this is done a micro switch or sensor (not shown) detects the dispensing of a dose of medication 15 and reduces the quantity of medication understood by the processor 530 to be held in container 400 by one. The dispensing lever 514 is then secured into its lowered position. It should be noted that the dispensing lever 514 could be adapted to engage the blister pack 400 near perforations 430 to separate an entire discrete portion 432 from the remainder of the blister pack while leaving the medication 15 inside its discrete portion. The discrete portion 432 of the blister pack 400 would then be discharged through opening 565 in the dispenser 500 so that the patient could remove the medication from the discrete portion themselves.

As previously described portions of the information 80 in the memory strip 460 can be transferred to the separate computer 270 or personal alerting device 290. Program codes 86 can be transferred so computer 270 is equipped with software to provide alert scheduling or to check for contra-indicated medications. Program codes 86 can be transferred to processor 530 of dispenser 500 to assist in scheduling alerts. Additional buttons (not shown) are used to enter the date and time. The dispenser can also be provided with other alarms (not shown) such as a visual or vibrational alarm, an infrared transmitter (not shown) for communicating with a separate computer, and connectors (not shown) for electrically

bottom surface 815 of the lid 810 and have an inside surface that is substantially flush with the inside surface 821 of the porthole 820.

Each vial 20 has a guide ring (not shown) similar to guide ring 30 that receives the sensing tab 825. The label 50 is affixed in the recess 28 of the vial 20. The recess 28, guide ring 30 and sensing tab 825 combine to align the textual portion 52 facing toward the front 812 of the unitary lid 810 when the vial is secured. This ensures that each textual portion 52 is visible when several vials 20 are secured to the unitary lid 810. The guide rings 30 also ensure that sensors 826 align with contacts 62 in control system 840 **(Figure 28)**, or that contacts 192 align with contacts 194 in control system 190 **(Figure 25)**.

The housing 811 of the unitary lid 810 has a number of openings 830 in its top surface 814. Each of these openings 830 is aligned directly above and forms a channel that extends through to a corresponding portholes 820. When the vial 20 is secured to the unitary lid 810, medication 15 can be removed from the vial 20 through the porthole 820 and opening 830. An access door 835 is provided to seal each opening 830. The door 835 has a hinge 836 that is secured to top surface 814 of the housing 811, and a latch 837. The door 835 pivots between open and closed positions 838 and 839. Medication 15 is sealed in the container when the vial 20 is secured to the lid 810 and the access door 835 is in its closed position 838. The latch 837 locks the door into its closed position 838. Medication 15 is removed from one of the vials 20 by releasing the appropriate latch 837, moving the corresponding door 835 to its open position 838, inverting the container 800 and pouring the medication out of the associated opening 830.

As shown in **Figure 28**, the unitary lid 810 includes a control system 840 that is similar to the control system 114 of containers 10, 300 and 400 shown in **Figure 9**. The

reflective surfaces 352-358 as in **Figure 16**. Sensing tab 825 and sensors 115 are similar in construction to the sensing tab 372 and sensors 374 of container 300. When the vial 20 is equipped with the conventional bar code in lieu of memory strip 60, the sensors 115 are optical sensors that read the bar coded information when the vial 20 is slid into one of the portholes 820 or rotated into a secure position in that porthole.

As shown in **Figure 28**, the control system 840 is equipped with two access control devices 845 and 846. These devices 845 and 846 are similar in design to solenoid locking assembly 180. The first access control device or vial locking solenoid assembly 845 serves the same purpose as assembly 180. Both assemblies 180 and 845 lock the vial 20 to the cap 100 of unitary lid 810 until a predetermined time, such as when the vial is empty. The second access control device or door locking solenoid assembly 846 locks the access door 835 in its closed position 839 to prevent the removal of medication 15 until the prescribed time to take the particular medication contained in the corresponding vial 20. This second access control device 846 includes a solenoid and plunger assembly similar to assembly 180. The plunger engages the latch 837 of the access door 835 to lock the door in its closed position 839. It should be understood that the medication 15 could also be accessed by removing the desired particular vial 20 from the unitary lid 810.

When one particular vials 20 is secured to its associated porthole 820, the information 80 contained in the information strip 60 of that particular vial is received by the sensors 115 associated with that porthole and communicated to the computer processor 120 in the unitary lid 810. This communication of information 80 occurs each time one of the vials 20 is secured to one of the portholes 820 of the unitary lid 810. The processor 120 notes which medication information 80 came from which sensor 115 and corresponding

removably secured to a unitary lid 860 as discussed below. Each particular vial 20 is equipped with its own corresponding interactive label 50 and machine readable and writable memory strip 60. As in the fifth embodiment, it should be understood that the label 50 of container 850 need not be interactive. The machine readable and writable memory strip 60 can be replaced by a memory device that is only machine readable. For example, memory strip 60 and its contacts 62 and wires 64 can be replaced by the several conductive/non-conductive or reflective/non-reflective surfaces and ground surface 352-358 as in container 300, or by a conventional bar code (not shown) applied to the surface of the label 50.

The unitary lid 860 includes an L-shaped housing 861 with a front 862, rear 863, top 864, bottom 865, and end surfaces 866 and 867. As best shown in **Figure 30**, the housing 861 has an intermediate wall 868 that extends from the top 864 of the housing down to a platform 969 for holding the vials 20. The portholes 870 are similar in construction to the portholes 820 of container 800, and are spaced equidistantly apart from one end 862 of the housing to the other end 863. Each porthole 870 has an inside surface 871 shaped and sized to snugly receive the top end 25 and ratchets 40 of one vial 20. Similar to container 800, the inside surface of each porthole 870 includes several hold down lugs 872 or threads for removably securing the vial 20 to the unitary lid 860. Each particular porthole 870 has a corresponding sensing tab 875 with sensors 15 like those of cap 100. The sensing tabs 875 project upwardly from the top surface 814 of the lid 860, and have an inside surface that is substantially flush with the inside surface 871 of the porthole 870.

Each vial 20 has a guide ring (not shown) similar to guide ring 30 that receives the sensing tab 875. The label 50 is affixed in the recess 28 of the vial 20. The recess 28, guide ring 30 and sensing tab 875 combine to align the textual portion 52 facing toward the front 862 of the unitary lid 860 when the vial 20 is secured. This ensures that each textual portion

changes in the prescribed dosing regimen 82. Receiver 893 can be a transceiver for transmitting information, such as consumption information 84, back to the pharmacy or prescribing physician. The second subset 892 includes multiple sets of components 894. Each set of components 894 is associated with one particular porthole. Each set 894 includes the sensors 115 associated with that particular porthole 870. Each set 894 also includes first and second access control devices 895 and 896, and a sensor 897 for the access door 885 associated with the particular porthole 870 as discussed below. The single LCD display 132 spans the length of the front 862 of the unitary lid 860. The display visually identifies the appropriate selector 885 to pull to obtain the appropriate, prescribed medication 15. The computer processor 120 instructs the display 132 to show an arrow pointing at the appropriate selector 885. Again, the circuit board (not shown) is somewhat larger than circuit board 130 due to the increase in number of components and the spacing apart of the various sets 892 of components along the length of the lid 860.

Figure 29 shows the vial 20 equipped with machine readable and writable memory strip 60 and contacts 62. The sensors 115 are located on the inside surface of each sensing tab 875. When one of the vials 20 is secured to a particular porthole 870, the contacts 62 of the memory strip 60 are in electrical communication with the sensors 115 for that porthole. As stated above, the memory strip 60 can be replaced by a memory device that is only machine readable. For example, the vial 20 is equipped with conductive/non-conductive or reflective/non-reflective surfaces 352-358 as in Figure 16. Sensing tab 875 and sensors 115 are similar in construction to the sensing tab 372 and sensors 374 of container 300. When the vial 20 is equipped with the conventional bar code in lieu of memory strip 60, the sensors 115 are optical sensors that read the bar coded information when the vial 20 is slid into one of the portholes 870 or rotated into a secure position in that porthole.

When the processor 120 determines that the time to take one doses of prescribed medication in one particular vial is approaching or has arrived, the processor sends a signal to the display 132 to show an arrow pointing to the associate porthole 870 holding that particular type of medication 15. The processor also sends an electric current to the selector lock solenoid 896 of the appropriate set 894 to release the plunger from engagement with the selector shaft 886 so that the selector 885 for that particular vial 20 is movable to its open position 888. When the selector 885 is moved toward its open position 888, the selector sensor 897 sends a signal to the processor 120. The processor 120 uses this signal to indicate that the prescribed dose of medication 15 was taken from the corresponding vial 20 at the time the selector 885 was moved to its open position 888. This consumption information is stored in the memory 125 of the unitary lid 810. The processor 120 could also send electric current to the vial lock 895 to allow access to the medication 15, and use this occurrence as the signal that medication 15 was consumed. When the memory device 60 on the vial 20 is machine readable and writable, the processor 120 can alter the memory device to include this consumption information.

Seventh Embodiment

Figure 31 shows a seventh embodiment of the medication container 900 for holding and organizing several different types of medication. This container 900 has an automated, unitary lid 910 that is similar to the unitary lid 860 of container 850. The vials 20 are replaced by blister cassettes 950. Each particular cassette 950 is physically separable from the other cassettes, but is removably secured to a unitary lid 910 as discussed below. Each particular cassette 950 is equipped with its own corresponding machine readable memory device or bar code 960. However, it should be understood that the cassette 950 could contain an interactive label 50. A machine readable and writable memory strip 60 can be

967 is affixed to the top or loop portion 957 of the housing 951 so that each label is visible when several cassettes 950 are secured to the unitary lid 910.

The housing 951 holds a conventional blister strip 970 formed by a series of connected blister packets 975 that are separable along a perforation or score line between each adjacent packet. Each blister packet 975 holds a dose of medication 15. The strip 970 is coiled up inside the housing 951 with the outer coil laying against the U-shaped channel 955 between rims 956. A free end 976 of the outer coil passes through the opening 954 in the front wall 952 of the cassette 950.

As shown in **Figure 31**, when the blister cassette 950 is secured to the unitary lid 910, the free end 976 of the blister strip 970 extends through opening 930. This places the end packet 975 in a reserve position 978. Medication 15 is obtained by pulling the end packet 975 completely through the opening 930, and tearing off the end packet 975 along the perforated line connecting it to its adjacent packet. The adjacent packet is now in the reserve position 978 with its free end 976 partially extending through opening 930, and is accessible when the next dose of medication is due to be taken.

The unitary lid 910 includes a control system 990 that is similar to control system 890 shown in **Figure 28**. The components making up control systems 890 and 990 are similar. System 990 are broken into two subsets of components 991 and 992. The first subset 991 includes one computer processor 120, memory 125, display 132, audible and vibratory alarms 134 and 138, real time clock 145, battery 150, and buttons 160, 162, 164 and 166. The first subset 991 also includes a RF receiver 993 for receiving information regarding necessary changes in the prescribed dosing regimen 82. Receiver 993 can be a transceiver for transmitting information, such as consumption information 84, back to the pharmacy or

976 of the blister strip 975 through opening 930 until the prescribed time to take the particular medication in the corresponding cassette 950. This second access control device 996 includes a solenoid and plunger assembly. The plunger engages the blister strip 975 and locks it in place so that it cannot be pulled out of the opening 930. It should be understood that the medication 15 could also be accessed by removing the desired particular vial 20 from the unitary lid 910.

When one particular cassette 950 is secured to its associated slot 920, the information 80 contained in the information strip 60 of that particular cassette is received by the sensors 115 associated with that slot and communicated to the computer processor 120 in the unitary lid 910. This communication of information 80 occurs each time one of the cassettes 950 is secured to one of the slots 920 of the unitary lid 910. The processor 120 notes which medication information 80 came from which associated sensor 115 for the particular slot 920. The processor 120 uses the its clock 145 and the prescribed dosing regimen information 82 obtained from the particular cassette 950 secured to its associate slot 920 to compute an appropriate time or times to take the particular medication 15 held by that cassette. The processor 120 then determines the appropriate time or times to take the particular type of medication 15 contained in each of the cassette 950 held by the slots 920.

When the processor 120 determines that it is time to take one doses of prescribed medication in one particular cassette 950, the processor sends a signal to the display 132 to show an arrow pointing to the associate slot 920 and cassette 950 holding that particular type of medication 15. The processor also sends an electric current to the blister strip locking solenoid 996 of the appropriate set 994 associated with slot 920 to withdraw the plunger from in front of the leading blister packet 975 so that this packet can be removed from its associated opening 930. When the blister packet 975 is removed and an other blister

receiving the vials 20 or cassettes 950. Each port 820, 870 or 920 has one corresponding pair of sensors 115 or 374 for reading the information 80 contained in the memory device 60, 352-358 or 960 of the vial 20 or cassette 950. Each port 820, 870 or 920 also has one corresponding opening 830, 880 or 930 through which the medication 15 in corresponding vial 20 or cassette 950 is dispensed. Each container 800, 850 or 900 includes a control system 840, 890 or 990, respectively, that includes a processor 120 for controlling the operations of the container.

The processor 120 organizes the activation of the display(s) 132 and alarm(s) 134, 136 and 138 for instructing and alerting the patient when it is time to consume one of the prescribed medications 15 held by the container. When the vials 20 or cassettes 950 are secured to the unitary lid 810, 860 or 960, the processor 120 reads the prescription information 80 from the memory device 60, 352-358 or 960, and calculates the appropriate time to take each of the medications 15 contained in the several vials 20 or cassettes 950.

The computer processor 120 uses the prescribed dosing regimen information 82 and the timing device 145 to calculate or otherwise develop the prescribed times for taking each of the different medications 15 held in the container 800, 850 or 900. The processor 120 uses its timing device 145 to determine when the predetermined time or times to take one of the particular types of medication occur. The computer processor then informs the patient that it is time to take a dose of medication 15 via the display 132, indicator 136, or other various alarms 134 and 138. Information 80 is also communicated to the processor 120 and memory 60, 125 via electrical contacts or via an RF or magnetically coupled link.

When the processor 120 determines that at least one medication 15 is due, the processor issues an audible alert using speaker 134. This alert can be in the form of a voice synthesized message that indicates the correct vial 20 or cassette 950 to access and amount

The medication containers 800, 850 and 900 compare the several medications 15 contained in their vials 20 or cassettes 950 by comparing the information 80 in each of their corresponding memory strips 60. For example, the processor 120 references and compares the lists of contraindicated medications that are part of the medication information 84. Should the processor 120 determine that two or more types of medications 15 secured to the unitary lid 810, 860 or 960 are contraindicated, the processor will display an appropriate message on the display 132 or activate one of the alarms 134, 136 or 138 to communicate this to the patient. Every time a medication 15 is issued to a patient, the most recent list of contraindications is included in the memory strip 60 or 960 of the vials 20 or cassettes 950. A list of contraindicated medications can also be maintained in the memory 125 of the lid 810, 860 or 910.

The memory 125 of each organizer 800, 850 or 900 is loaded with information containing a list of medications for whom the particular patient is known to be allergic. The organizer 800, 850 or 900 will alert the patient or care giver if one of the vials 20 or cassettes 950 secured to the unitary lid 810, 860 or 910 contains medication identified as being one of the medications in the list of allergic medications. The list of allergic medications can be downloaded from a pharmacy workstation to the memory 125 prior to giving the unitary lid to the particular patient or their care giver. The list of allergic medications can also be downloaded from the memory device 60 or 960 of one of the vials 20 or cassettes 950 secured to the unitary lid 810, 860 or 960. The processor 120 then compares each type of medication contained by the vials 20 or cassettes 950 secured to the unitary lid to the list of allergic medications to determine if one of the vials or cassettes contains an allergic medication. If an allergic medication is identified, the processor 120 indicates an appropriate message on the display 132 or activate one of the alarms 134, 136 or

of each vial 20 or cassette 950 contains information that identifies the particular person for whom the medication is prescribed or prescribed person information. The memory 125 of the unitary lid 810, 860 or 960 is provided with particular patient information that identifies the person that should be using the unitary lid. The particular patient information can be downloaded from a pharmacy workstation to the memory 125 prior to giving the unitary lid to the particular patient or their care giver. The particular patient information can also be downloaded from the memory device 60 or 960 of a first vial 20 or cassette 950 secured to the unitary lid 810, 860 or 960. In this case, the particular patient information is the same as the prescribed information contained in the memory device 60 or 960 of that first vial 20 or cassette 960 secured to the unitary lid 810, 860 or 960. The computer 120 then compares the particular patient information to the prescribed patient information to determine if they identify the same patient. If the two sets of patient information do not identify the same patient, the processor 120 indicates an appropriate message on the display 132 or activate one of the alarms 134, 136 or 138 to warn the patient or care giver that the particular type of medication in the vial 20 or cassette 950 is not intended for this particular patient.

When the processor 120 determines that two different medications 15 are to be taken at the same time, the organizer 800, 850 or 900 signals the indicator 136 to flash or the display 132 to indicate a message instructing the patient to consume the proper amount of each medication. The processor 120 instructs the patient to take one type of medication 15 at a time. The patient is alerted to each appropriate prescribed medication in sequence. This sequencing avoids telling the patient to simultaneously obtain two pills from a first vial 20 or cassette 950 and one pill from a second vial or cassette. Many patients may get confused and dispense them in the opposite quantities. With respect to container 800, since in the patient is removing the medication via the access doors 835, they may accidentally remove

CLAIMS

I claim:

1. A medication container for organizing different types of medication comprising:

a plurality of separate and particular vials, each of said particular vials having an inside surface that defines a compartment, said compartment of each of said particular vials being adapted to hold a particular type of medication;

a plurality of machine readable memory devices, each of said particular vials having a corresponding memory device, each of said corresponding memory devices being adapted to contain prescribed dosing information corresponding to said particular type of medication in said particular vial;

a unitary lid having a plurality of particular ports, each of said particular vials being removably securable to one of said particular ports, said lid further having a plurality of sensors, each particular port having a corresponding sensor, and each corresponding sensor communicating with said corresponding memory device of said particular vial secured to said particular port, said unitary lid having a computer processor in electrical communication with a timing device, a communication device, and said plurality of sensors, said prescribed dosing regimen information contained in each of said memory devices being transmitted to said computer processor when each of said particular vials are secured to their said particular ports, said computer processor using said timing device and said prescribed dosing regimen information from each of said memory devices to develop a predetermined time to take each of said particular types of medication, and said computer processor communicating said predetermined time to said communication device.

8. The medication container of Claim 6, and wherein each of said corresponding openings includes a selector that is movable from open and closed positions for obtaining one dose of medication from said compartment of said particular vial secured to said particular port.

9. The medication container of Claim 6, and wherein each of said ports includes an access control device, each of said access control devices being adapted to prevent removal of said particular type of medication from said corresponding opening until said predetermined time occurs.

10. The medication container of Claim 9, and wherein said access control device is a locking mechanism located in said lid, and said locking mechanism prevents removal of said vial from said lid until said predetermined time occurs.

11. The medication container of Claim 1, and wherein each of said particular vials has a guide ring with an opening aligned with said memory strip secured to said particular vial, and said corresponding sensor is located on a corresponding sensing tab, and said guide ring and corresponding sensing tab cooperate to facilitate communicative alignment of said corresponding sensor with said memory strip.

12. The medication container of Claim 1, and wherein said memory strip contains contraindication information and said processor sends a signal to the communication device when one particular vial containing one particular type of medication is determined by said

said particular port, said unitary lid having a computer processor in electrical communication with a timing device, a communication device, and said plurality of sensors, said prescribed dosing regimen information contained in each of said memory devices being transmitted to said computer processor when said particular cassettes are secured to their said particular ports, said computer processor using said prescribed dosing regimen information and said timing device to develop a predetermined time to take each particular type of medication, and said computer processor communicating said predetermined time to said communication device.

16. The medication container of Claim 15, and wherein each of said plurality of ports has a corresponding opening, and said particular type of medication held in said particular cassette secured to its said particular port is removed via said corresponding opening.

17. The medication container of Claim 16, and wherein each of said cassettes is a blister strip cassette holding a blister strip, and a free end of said blister strip projects through said corresponding opening.

18. The medication container of Claim 15, and wherein said communication device includes a display and said display indicates the particular cassette from which the particular type of medication is to be taken.

19. The medication container of Claim 15, and wherein said unitary lid has a predetermined length and said ports are aligned linearly along said length of said lid, and said display spans said length of said lid so as to be positioned in front of each port.

25. The medication container of Claim 15, and wherein said memory device is machine readable and writable, and said memory device is altered to contain actual consumption information.

26. A method of detecting contraindicated medications, the detection method comprising the steps of:

providing a unitary lid and a plurality of containers, said unitary lid having a computer processor, an associated memory and a plurality of ports, each of said containers holding a particular type of medication and having a memory device containing medication type information that identifies the type of medication in said container, one of either of said associated memory and said memory device having a list of contraindicated medications;

joining each of said containers to one of said ports;

communicating said medication type information in said memory device of each of said containers and said list of contraindicated information to said computer processor;

using said processor to compare said medication type information from each of said containers with said list of contraindicated medications, and to determine when said medication type information of two of said containers are contraindicated; and,

communicating that said containers contain contraindicated medications.

27. The detection method of Claim 26, and wherein said container is one of either a vial or a cassette.

28. A method of detecting medication for whom a particular person is known to be allergic, the detection method comprising the steps of:

using said processor to compare said particular person information with said prescribed person information, and to determine when said particular person information differs from said prescribed person information; and,

communicating that the medication is not intended for the particular person.

31. The ensuring method of Claim 30, and wherein said container is one of either a vial or a cassette.

32. A medication container for containing doses of medication, said medication container comprising:

a first piece having inside and outside surfaces, said inside surface defining a compartment, and said compartment containing the medication;

a machine readable and writable, memory strip containing prescribed dosing regimen information for the medication, said memory strip being secured to said first piece;

a second piece adapted for removable securement to said first piece, said second piece having a sensor positioned to communicate with said memory strip when said second piece is secured to said first piece, said second piece having a timing device and a communication device, said timing device, communication device and sensor being in electrical communication with a computer processor, said prescribed dosing regimen information in said memory strip being transmitted to said computer processor when said first piece is secured to said second piece, said computer processor using said prescribed dosing regimen information and said timing device to develop a predetermined time to take the medication, and said computer processor communicating said predetermined time to said communication device; and,

program enabling said container to allow access to one of the packets at said predetermined time.

38. The medication container of Claim 33, and further including a plurality of separate and particular cassettes, each of said cassettes having a corresponding memory device, and wherein said lid has a plurality of ports, each of said ports having a corresponding sensor in communication with said computer processor, each of said particular cassettes being adapted for removable securement to a corresponding port, said corresponding sensor sensing said information of said corresponding memory device of said particular cassette secured to said corresponding port, wherein movement of said lid allowing access to the medication of said particular cassette secured to said corresponding port causes said computer processor to obtain consumption time information corresponding to said movement, and said consumption time information is recorded in said memory strip.

39. A medication container for containing doses of medication, said medication container comprising:

a first piece having inside and outside surfaces, said inside surface defining a compartment, and said compartment containing the medication;

a machine readable and writable memory strip containing quantity information regarding the quantity of the doses of medication in said first piece, said memory strip being secured to said first piece; and,

a second piece adapted for removable securement to said first piece, said second piece having a sensor positioned to communicate with said memory strip when said second piece is secured to said first piece, said sensor being in electrical communication with a

said memory strip includes prescribed dosing regimen information, and said computer processor uses said prescribed dosing regimen information and said timing device to develop a predetermined time to take the medication, and said computer processor communicates said predetermined time to said communication device.

45. The medication container of Claim 44, and wherein said computer processor obtains removal time information from said timing device corresponding to said removal information, said computer processor communicating said removal time information to said memory strip.

46. The medication container of Claim 43, and wherein said memory strip contains a program for developing said predetermined time, said program being communicated to said computer processor when said memory strip is in communication with said sensor, said program enabling said access control device to dispense the medication at said predetermined time.

47. The medication container of Claim 40, and wherein said memory strip contains prescription information, and said lid further includes means for communicating said prescription information to a separate computer.

48. The medication container of Claim 42, and further including a plurality of separate and particular cassettes, each of said cassettes having a corresponding memory device, and wherein said lid has a plurality of ports, each of said ports having a corresponding sensor and a corresponding separate sensor in communication with said computer processor, each of said cassettes being adapted for removable securement to a corresponding port of said

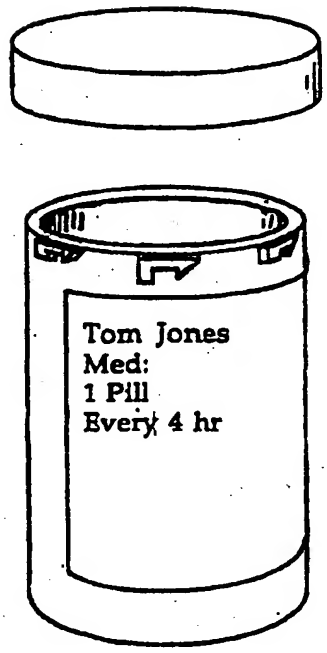


Figure 1 (PRIOR ART)

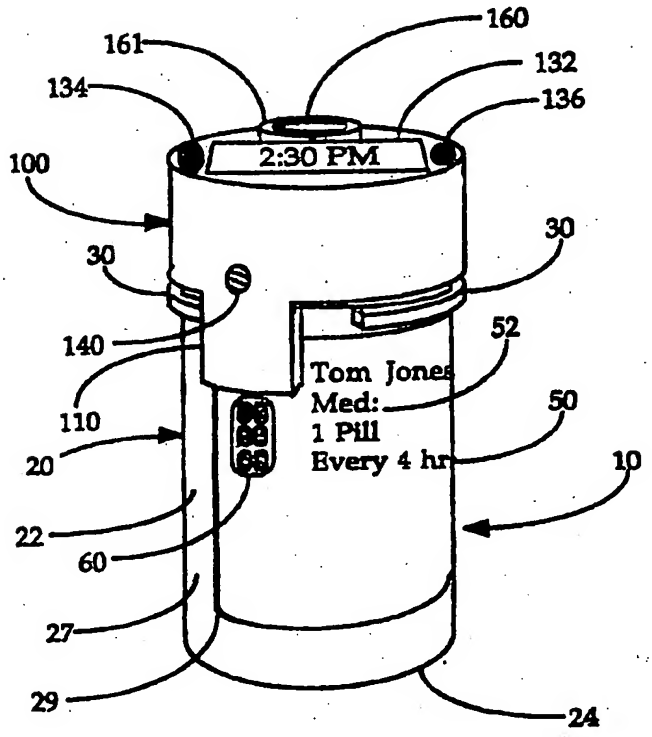


Figure 2

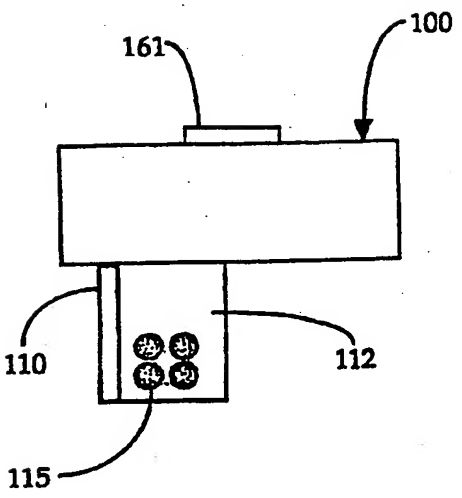


Figure 6

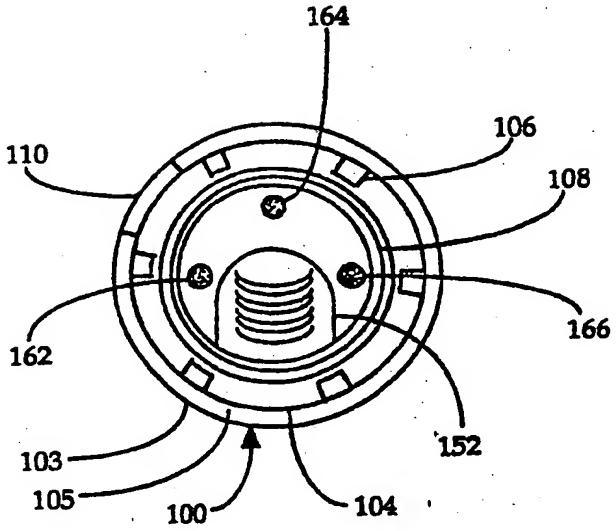


Figure 7

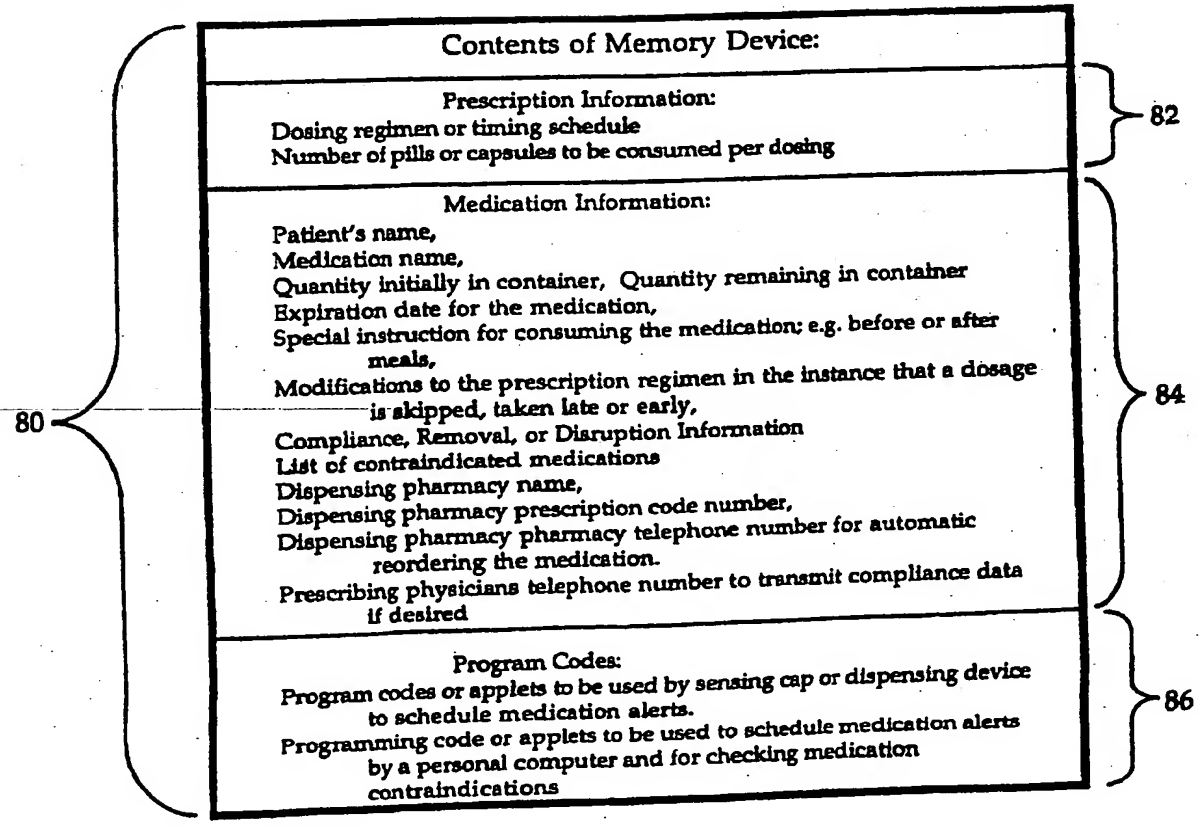


Figure 8

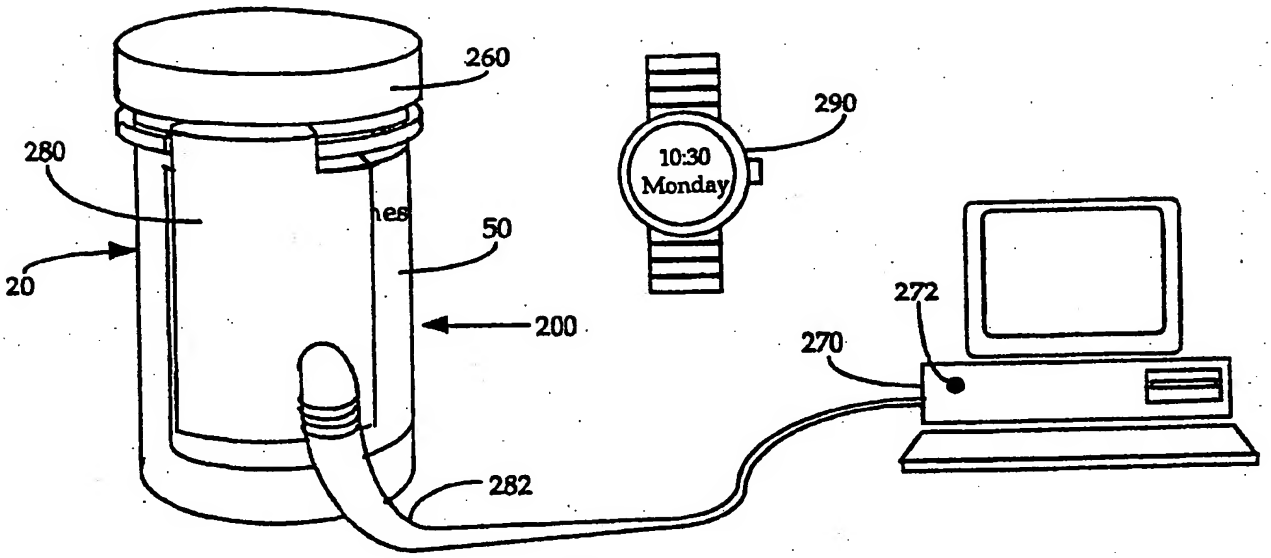


Figure 12

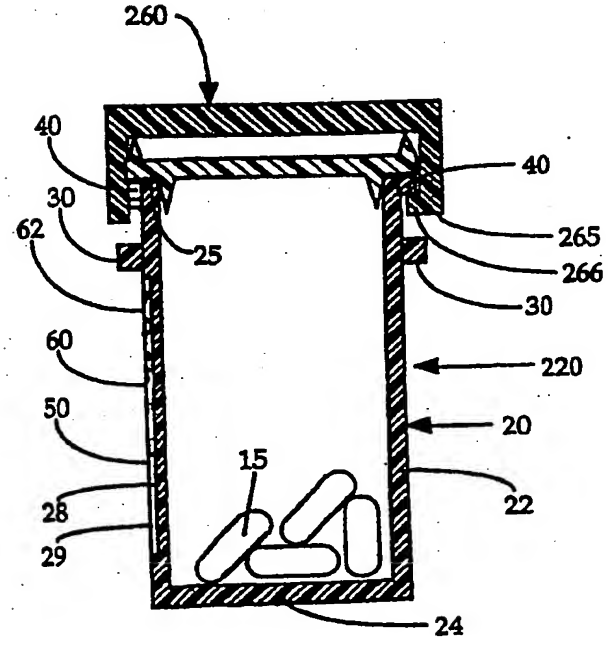


Figure 13

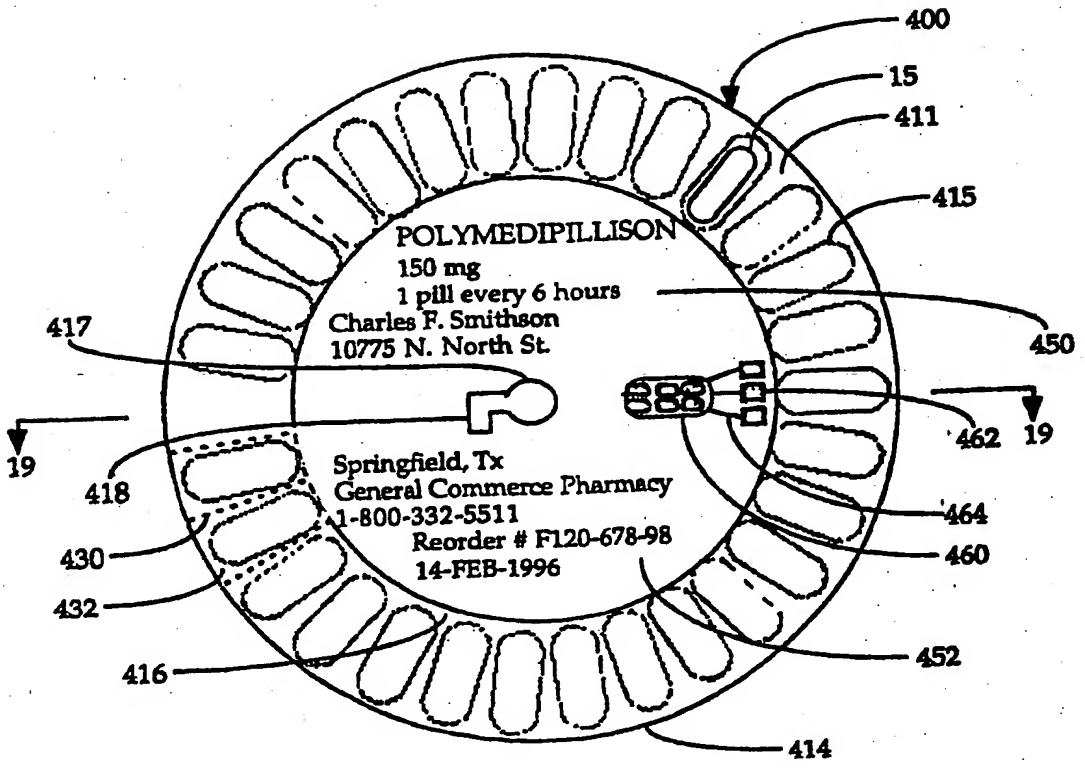


Figure 18

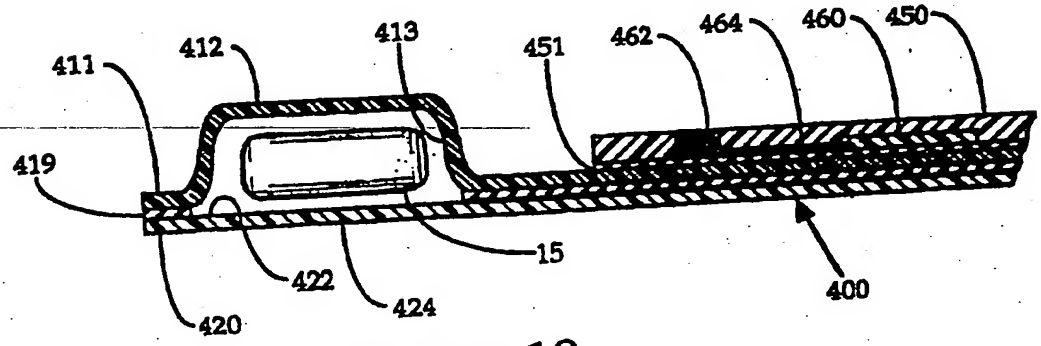


Figure 19

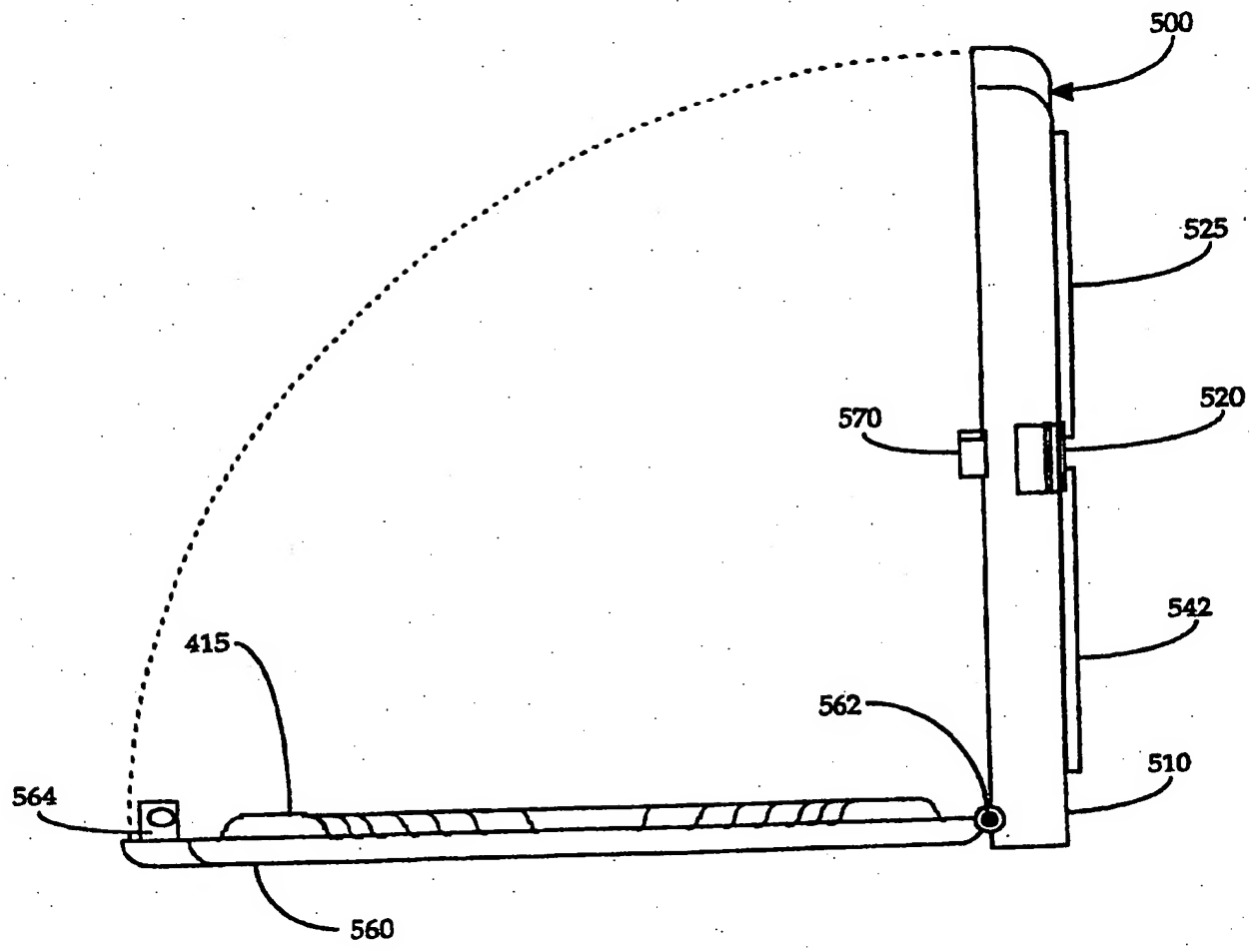


Figure 21

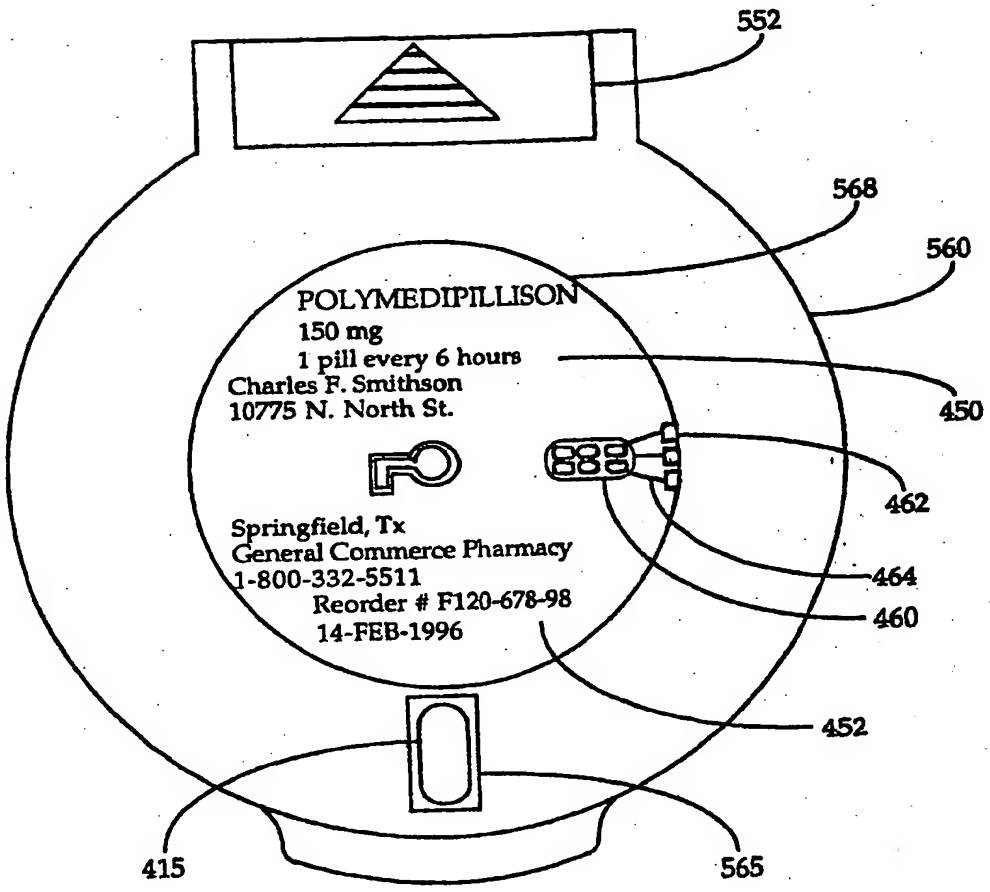

552
568
560
POLYMEDIPILLISON
150 mg
1 pill every 6 hours
Charles F. Smithson
10775 N. North St.
450
462
Springfield, Tx
General Commerce Pharmacy
1-800-332-5511
Reorder # F120-678-98
14-FEB-1996
464
460
452
415
565

Figure 24

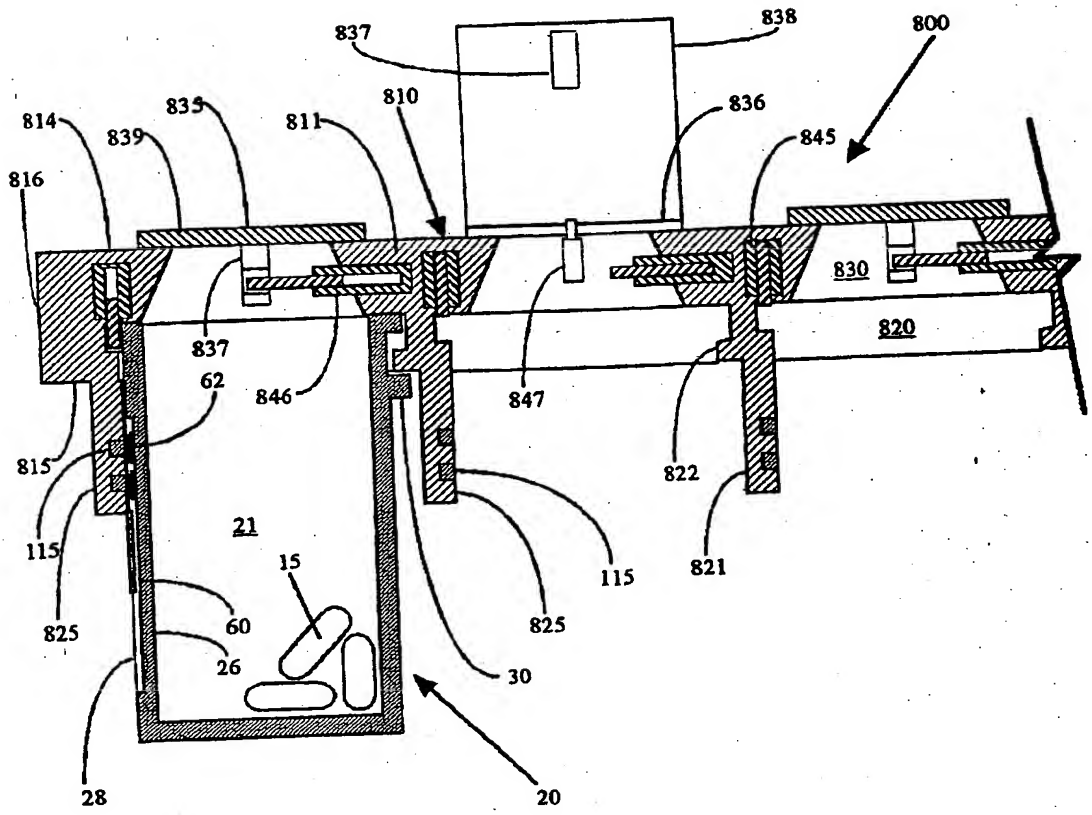

837
838
800
814
839
835
811
810
836
845
816
830
820
837
846
847
62
822
815
21
115
15
115
821
825
60
825
26
30
28
20

Fig. 27

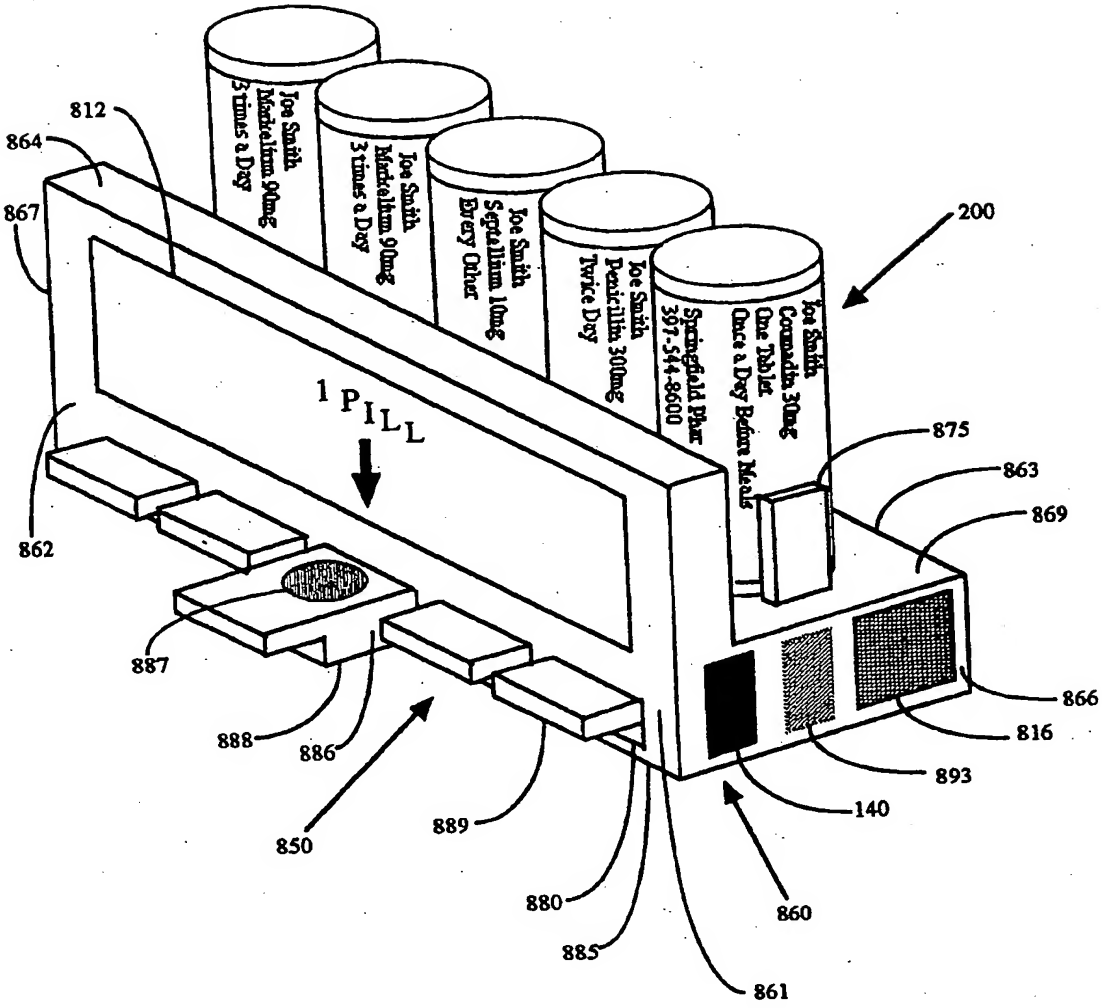

Joe Smith
Metoclopram 90mg
3 times a Day
Joe Smith
Metoclopram 90mg
3 times a Day
Joe Smith
Septellinm 10mg
Every Other
Joe Smith
Penicillin 300mg
Twice Day
Springfield Phar
397-544-8600
Joe Smith
Coumadin 30mg
One Tablet
Once a Day Before Meals
1 PILL
812
864
867
862
887
888
886
850
889
880
885
861
860
140
893
816
866
869
863
875
200

Fig. 29

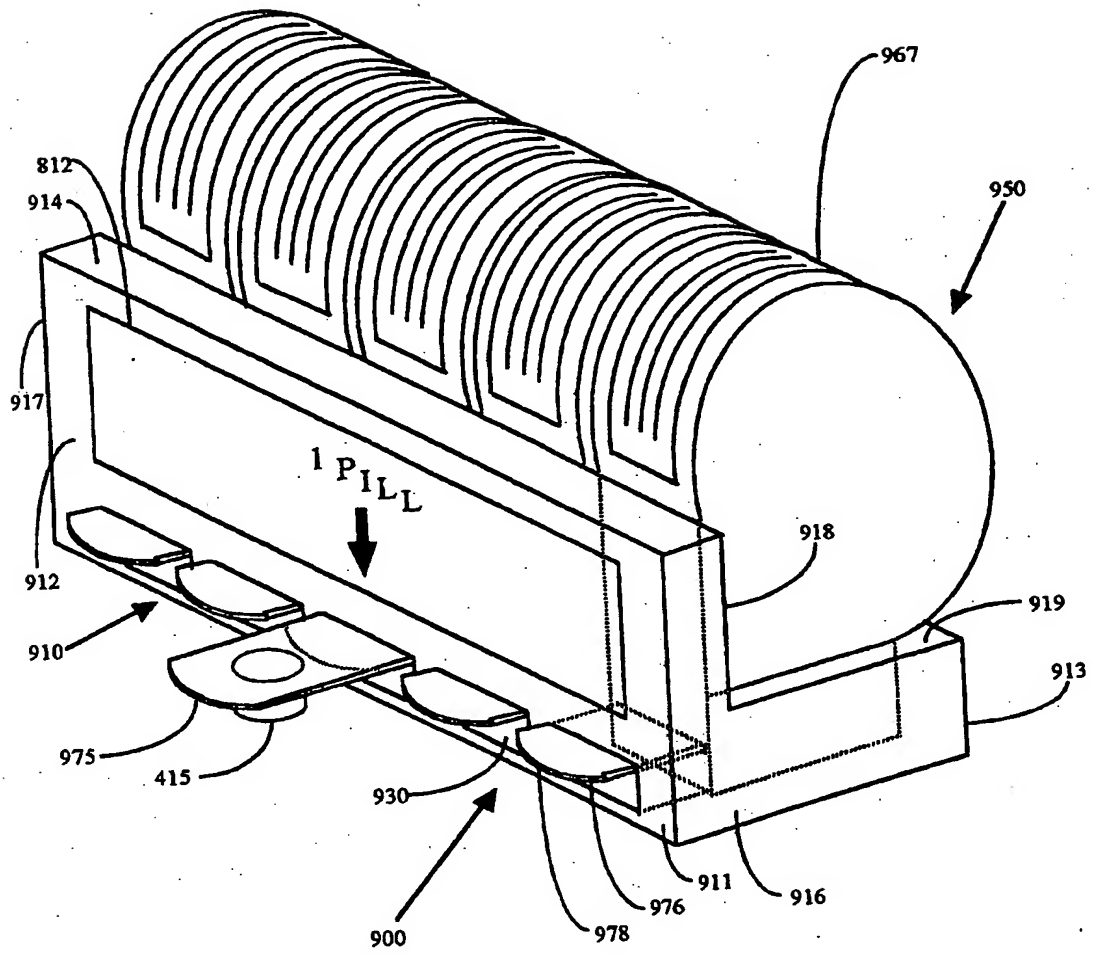
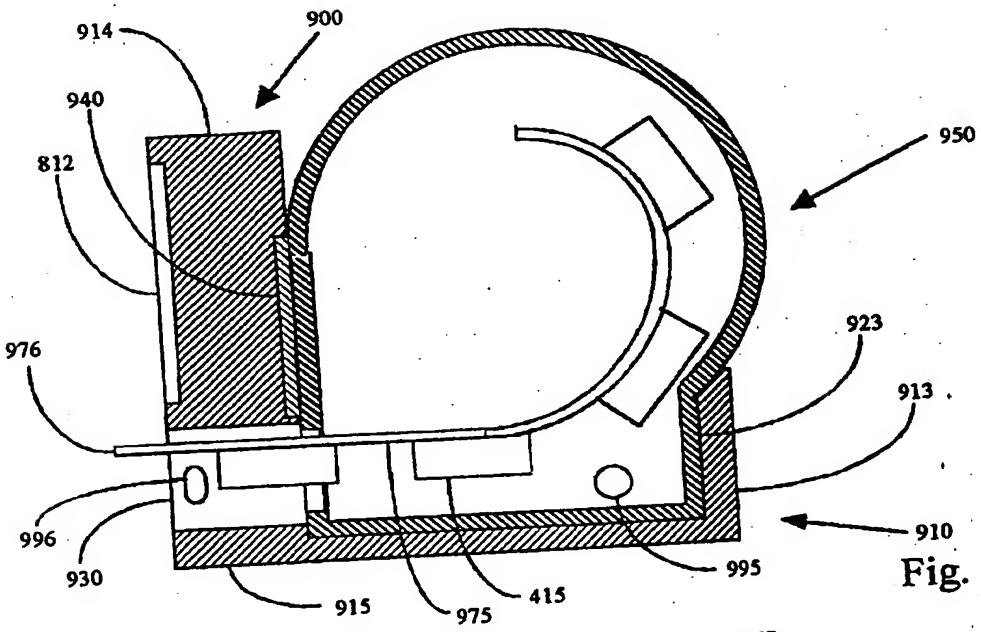

967
812
914
950
917
$^{1}P_{ILL}$
918
912
919
910
913
975
415
930
911
916
976
900
978

Fig. 31


914
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976
923
913
996
930
910
995
915
975
415

Fig. 33

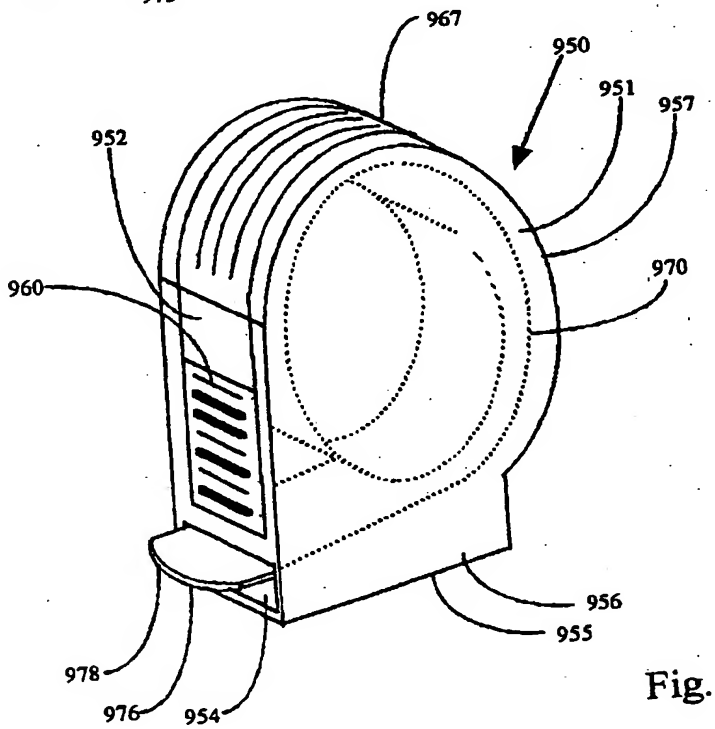
967
950
951
957
952
970
960
956
955
978
976
954

Fig. 34